

O0120-013-13  
April 30, 2021

Christopher McGoldrick, Town Planner  
Grafton Municipal Center  
30 Providence Road  
Grafton, MA 01519

Re: **Village at Grafton Woods, 8 Pine Street  
Plan Approval Application - Peer Review Response to Comments**

Dear Chris:

Tighe & Bond has received initial peer review comments for the Village at Grafton Woods Project located at 8 Pine Street in Grafton, Massachusetts. The project was submitted for Planning Board Review under Section 13 of the Grafton Zoning Bylaw in February 2021. The following letter provides responses, in bold lettering, to each comment issued by Graves Engineering, Inc. (GEI) in a letter dated April 6, 2021.

### **Zoning By-Law**

1. GEI has no issues with compliance with the Grafton Zoning By-Law except as noted in the following six comments.

**Tighe & Bond (T&B) Response: Comment acknowledged.**

2. The approximate locations of driveways, buildings and parking areas within two hundred feet of the property lines need to be shown on the plans. More specifically, the Idexx Laboratories building needs to be shown as does the entire intersection of the MBTA Commuter Rail driveway at Pine Street (§1.3.3.3.d.11).

**T&B Response: Driveway locations within 200 feet of the property lines of 8 Pine Street have been added to the Site Plans, including the Idexx Laboratory and MBTA facilities.**

3. The lot coverage calculations need to show the percentage of pavement (§1.3.3.3.d.15).

**T&B Response: The lot coverage calculations have been revised to include the percentage of pavement.**

4. Once the design of the parking garage is advanced to the point that the number of parking spaces is determined, the Parking Calculation table on Sheet G-003 needs to be updated to demonstrate compliance with the parking space requirements. By way of Note 1 in the Parking Calculation Table, GEI recognizes that the design engineer's intent is to provide the required number of parking spaces (§1.3.3.3.d.16 & §1.3.3.3.d.19).

**T&B Response: The Parking Calculation table on Sheet G-003 has been revised to include the proposed parking counts for both the residential and retail parking areas. The revised table demonstrates compliance with the parking space requirements.**

5. Calculations need to be provided to show the volume of earth material to be removed or filled on the property (§1.3.3.3.d.17).

**T&B Response: Calculations demonstrating the volume of earth material to be removed or filled on the property are provided on Sheet G-003.**

6. The plans need to address how dust will be controlled during construction (§1.3.3.3.d.29).

**T&B Response: Additional dust control notes are included on Sheet G-003.**

7. The plans should include a sheet with vehicle turning template for the Grafton Fire Department's largest vehicle (Tower 1) superimposed to demonstrate vehicle maneuverability around the buildings. Of particular concern is maneuverability around the easternmost building corner: the inside curb radius is 20 feet, the outside curb radius is 40.5 feet, and the building corner and guard rail will be impediments to maneuverability. (§13.7.C.4.z.v).

**T&B Response: Fire apparatus turning movement information is provided on the attached Figure 1.**

### **Hydrology & MassDEP Stormwater Management**

8. Due to the hydrology comments contained herein, revisions will be necessary. Please consider this as a preliminary review of the hydrology computations.

**T&B Response: Comment acknowledged. The hydrologic analysis has been revised to address the comments below. A summary of the peak discharge rates and runoff volume to Point of Analysis 1 is provided below:**

Table 1 Peak Discharge Rates		2-Year Storm Event	10-Year Storm Event	100-Year Storm Event
Point of Analysis 1	Existing	6.62 cfs	13.80 cfs	32.85 cfs
	Proposed	5.33 cfs	13.60 cfs	37.73 cfs
Point of Analysis 2	Existing	0.43 cfs	1.08 cfs	2.94 cfs
	Proposed	0.39 cfs	0.86 cfs	2.14 cfs
Point of Analysis 3	Existing	0.97 cfs	1.84 cfs	4.02 cfs
	Proposed	0.69 cf	1.38 cfs	3.14 cfs
Point of Analysis 4	Existing	0.27 cfs	0.45 cfs	0.90 cfs
	Proposed	0.0 cfs	0.0 cfs	0.0 cfs
Project Total	Existing	<b>7.73 cfs</b>	<b>16.02 cfs</b>	<b>37.92 cfs</b>
	Proposed	<b>6.41 cfs</b>	<b>15.83 cfs</b>	<b>41.16 cfs</b>

Table 2 Runoff Volume		2-Year Storm Event	10-Year Storm Event	100-Year Storm Event
Point of Analysis 1	Existing	0.705 ac-ft	1.449 ac-ft	3.509 ac-ft
	Proposed	0.441 ac-ft	1.096 ac-ft	3.421 ac-ft

9. In the post-development hydrology during the 100-year storm event, Pond 3P, 5P, 6P and 14P (subsurface infiltration systems) exceed the storage range from fourteen to eighty feet.

**T&B Response: The Subsurface Infiltration System models has been modified so that they do not exceed the defined storage range. Please refer to the revised proposed conditions HydroCAD reporting attached to this letter.**

10. In the post-development hydrology during the 100-year storm event, Pond CB4 has a peak elevation that is roughly two-and-a-half feet above the grate/rim elevation. On Sheet C-106, if this catch basin is designed to surcharge, then the surcharged water needs to be contained around the catch basin.

**T&B Response: The hydrologic model has been revised to avoid surcharging in CB-4 during the 100-year storm event.**

11. In the post-development hydrology modelling, Pond 6P (Subsurface Infiltration System 4) should be routed through Pond DMH-6, as shown on the Site Plans. The plans and the hydrology modelling need to coordinate with each other.

**T&B Response: The hydrologic model has been revised to reflect the routing demonstrated in the Site Plans.**

12. In the post-development hydrology for Pond 3P: Subsurface Infiltration System 2, the primary outlet is shown to be a twelve-inch round culvert with an invert elevation of 431.00 feet whereas on Sheet C-506 the construction detail shows a fifteen-inch culvert with an invert elevation of 429.7 feet. The plans and the modelling need to coordinate with each other.

**T&B Response: The Site Plans have been revised to match the hydrologic modeling.**

13. In the post-development hydrology for Pond 5P: Subsurface Infiltration System 3, the primary outlet is shown to be a twelve-inch round culvert whereas on Sheet C-507 the construction detail should a fifteen-inch round culvert. The plans and the hydrology modelling need to coordinate with each other.

**T&B Response: The Site Plans have been revised to match the hydrologic modeling.**

14. In the post-development hydrology for Pond 6P: Subsurface Infiltration System 4, the primary outlet is shown to be a twelve-inch round culvert whereas on Sheet C-106 the outlet manhole (DMH-17) shows an outlet as a fifteen-inch round culvert. The plans and the modelling need to coordinate with each other.

**T&B Response: The Site Plans have been revised to match the hydrologic modeling.**

15. In the post-development hydrology for Pond 12P: Infiltration/Detention Basin, the emergency spillway was modelled as a ten foot long by six-foot breadth broad-crested weir whereas on Sheet C-106, the spillway scales to be fifteen feet long by eight feet in breadth. The plans and the modelling need to coordinate with each other.

**T&B Response: The hydrologic model has been revised to match emergency spillway dimensions demonstrated on the Site Plans.**

16. In the post-development hydrology for Pond 12P: Infiltration/Detention Basin, the emergency spillway was modelled as elevation 410.75 feet whereas on Sheet C-106, the emergency spillway is shown to be as elevation 410.50 feet. Furthermore, there

needs to be one foot of freeboard between the spillway and the top of the berm elevation.

**T&B Response: The Site Plans and hydrologic model have been revised to reflect the same emergency spillway design information, and to provide the required one foot of freeboard.**

17. For Ponds 3P, 5P, 6P and 14P (subsurface infiltration systems) there are sharp-crested rectangular weirs modelled with a length of 0.5 feet whereas on Sheet C-506 the construction detail for the infiltration system outlet structure has the effective length of the weir across the entire diameter of the manhole structure. The plans and the modelling need to coordinate with each other.

**T&B Response: The hydrologic model has been revised to reflect the 4-foot long weir in the outlet structures of each subsurface infiltration system.**

18. For Ponds 3P, 5P, 6P and 14P (subsurface infiltration systems) the size of the systems are shown incorrectly on the plans. For example, on Sheet C-105 Infiltration System 1 is scaled to be twenty-four feet wide by one hundred twenty-size feet long (24'x126') whereas in the hydrology calculations the proper sizing for the MC-4500 system is thirty seven and fifty-eight feet wide and forty-three and thirty-four feet long (37.58'x43.34'). The plans and the modelling need to coordinate with each other.

**T&B Response: The Site Plans have been revised to reflect the subsurface infiltration system sizing in the hydrologic model.**

19. Compliance with MassDEP Stormwater Handbook appears to be reasonable except as noted in the following comments.

**T&B Response: Comment acknowledged.**

20. Soil testing needs to be performed at the proposed locations of the stormwater infiltration facilities to demonstrate that the required groundwater offset will be achieved and that the subsurface conditions are suitable for infiltration.

**T&B Response: A comprehensive boring and test pit program was conducted in October 2020 and January 2021 to evaluate subsurface soil and groundwater conditions on the property. At that time, subsurface infiltration locations were not determined. Test pit and boring locations are provided on Sheets C-100, C-101 and C-102 of the Site Plans. Confirmation of soil textures and groundwater elevations within each infiltration practice will be determined prior to construction. We request the Board consider a condition of approval to confirm groundwater elevations within the boundaries of each infiltration system prior to construction.**

21. The Stormceptor sizing report for the water quality units show sizing for three water quality units but four units are shown on the plans. The water quality units need to be labeled to coordinate with the sizing report (e.g. WQU 2, WQU 2, etc.) and a sizing calculation for the further water quality unit needs to be provided.

**T&B Response: Stormceptor sizing for all units has been revised and is attached to this letter. An additional water quality unit was added to the treatment train for the retail parking structure, shown on Sheet C-106.**

22. In the total suspended solids (TSS) removal calculation worksheet, the pre-treatment shows a proprietary treatment device that has a [removal] rate of 52%. It appears that this proprietary treatment device is intended to be the oil/grit separator.

According to the MassDEP Stormwater Handbook a removal rate of 25% is more appropriate.

**T&B Response: The proprietary treatment device in the Pretreatment TSS removal sheet is a reference to the water quality units, not the oil/grit separator. An additional sheet has been added for the pretreatment train containing the oil/grit separator.**

23. In the TSS removal calculations worksheets, Treatment Train 1 and Treatment Train 2 both credit 10% TSS removal for monthly street sweeping, however the operation and maintenance plan does not support the 10% removal credit (only quarterly street sweeping).

**T&B Response: The street sweeping TSS removal credit has been updated to reflect the quarterly removal credit of 5%.**

24. In the TSS removal calculations worksheet for Treatment Train 2, it appears that this worksheet refers to the southern parking area to wetland. There needs to be a minimum of 80% TSS removed prior to discharging to the wetland.

**T&B Response: Treatment Train 2 consists of the paved parking area below the retail area parking deck. The area receiving rainfall subject to this treatment train is minimal as the parking deck will receive the majority of runoff and is treated through a separate Treatment Train. Per Volume 3 of the Massachusetts Stormwater Handbook, this discharge is considered *de minimus* and meets the criteria identified therein. The discharge rate during the 2-year, 24-hour storm event is less than 1 cfs, and the site-wide weighted average TSS removal rate exceeds 80% as identified in the table below:**

	% TSS Removal	Area to Treatment Train (sf)	% TSS Removal x Area to Treatment Train (sf)
Treatment Train 1	93%	16,804	15,628
Treatment Train 2	66%	23,436	15,468
Treatment Train 3	93%	30,070	27,965
Treatment Train 4	80%	26,205	20,964
Total	83%	96,515	80,025

### **General Engineering Comments**

25. There needs to be additional spot elevation at the handicap accessible parking spaces to demonstrate compliance with the Massachusetts Architectural Access Board (MAAB) requirements.

**T&B Response: Additional spot grade information has been included on the revised Site Plans to demonstrate compliance with MAAB requirements. It is expected that a waiver from the MAAB requirements will be required due to the existing running slope of Pine Street and the inability to meet maximum slope requirements due to the existing condition.**

26. On Sheet C-107, the sewer pipe has no slope between the building face and sewer manhole (SMH) 1.

**T&B Response: The Site Plans have been revised to provide appropriate slope for the sanitary sewer service to SMH 1.**

27. On Sheet C-107, the label for SMH 2 shows one of the inlet inverts to be lower than the outlet invert. The outlet needs to be the lowest invert.

**T&B Response: The Site Plans have been revised to reflect appropriate invert information for SMH 2.**

28. On Sheet C-108, the reconfigured sewer system layout originating at Pine Street shows a change in flow direction of greater than ninety degrees. This is a problematic configuration that can result in excessive clogging. The change in direction needs to be limited to ninety degrees.

**T&B Response: The Site Plans have been revised to adjust the sanitary sewer reconnection layout.**

29. On Sheet C-108, the elevations of the reconfigured sewer layout between Pine Street and SMH 9 need to be revised. The proposed invert elevations of SMH 6 are too low.

**T&B Response: The Site Plans have been revised to reflect modification to the sanitary sewer layout. Invert information has been revised accordingly.**

30. Sheet C-106 has erosion control barriers only proximate to the wetlands. Erosion control barriers need to be provided at all down-gradient sides of the work on Sheet C-105 and C-106.

**T&B Response: The Site Plans have been revised to include erosion control barriers at all downgradient limit of work lines.**

31. On Sheet C-106, DMH-14 needs to include the rim elevation for the structure.

**T&B Response: The Site Plans have been revised to include rim elevation information for DMH-14.**

32. On Sheet C-504, there is a construction detail for "typical drainage line and sewer trench section" that show the pipes to be bedded on sand or gravel borrow. The construction detail should specify that the storm drain line is to be bedded gravel or stone. GEI understands that the sewer pipe should be bedded in stone, but defers to the Grafton Sewer Department.

**T&B Response: The Site Plans have been revised to distinguish between drain and sanitary sewer trench requirements of the Town of Grafton Sewer Department.**

33. On Sheet C-507, the construction detail for Stormwater Infiltration System 4 needs to include information (e.g. elevations) associated with the outlet manhole (DMH-17).

**T&B Response: The Site Plans have been revised to include additional detail for the outlet control structure of Subsurface Infiltration 4.**

### **General Comments**

34. The plans need to address how snow storage associated with the upper decks of the parking garages will be addressed.

**T&B Response: The Site Plans have been revised to include information regarding snow storage and management on site.**

35. GEI did not review for compliance with Grafton Stormwater Regulations or Wetland Regulations. Per my discussion with the Grafton Conservation Agent, GEI will proceed with such a review once we receive revised plans and a revised stormwater management report.

**T&B Response: Comment acknowledged. Revised stormwater documentation is provided as attached to this letter.**

36. GEI understands that the Grafton Sewer Department and the Grafton Water District will review the plans relative to their respective utilities.

**T&B Response: Comment acknowledged.**

37. GEI did not review the architectural plans.

**T&B Response: Comment acknowledged.**

We trust this information will be satisfactory in your review of the Village at Grafton Woods project. Should you have any questions or need additional information, please contact me at 413.572.3238 or [jechristy@tighebond.com](mailto:jechristy@tighebond.com).

Very truly yours,

**TIGHE & BOND, INC.**



Jean E. Christy, PE  
Senior Engineer

Attachments:

- A Revised Site Plans, dated April 2021
- B Figure 1 – Fire Apparatus Routing
- C Revised Proposed Conditions hydrologic calculations
- D Stormceptor design calculations
- E TSS Removal Calculation Worksheets

Copy: GSX-ODG, LLC (w/o encl)  
Jeffrey Walsh, Graves Engineering (w/ encl)  
Grafton Conservation Commission (w/ encl)

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